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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/671,227	09/24/2003	Harri Valio	944-001.010-3	8209

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EXAMINER

TRAN, KHANH C

ART UNIT	PAPER NUMBER
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2631

DATE MAILED: 08/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/671,227

Applicant(s)

VALIO, HARRI

Examiner

Khanh Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09/24/2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 01/07/2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 25, 28, 31 and 34 are rejected under 35 U.S.C. 102(e) as being anticipated by Kohli et al. U.S. Patent 6,393,046.

Regarding claim 25, in column 7, lines 1-45, Kohli et al. invention provides an improved multipath signal processing technique which directly cancels the effect of multipath signals by processing the composite of direct and multipath signals as received to create a synthesized replica of the signal as received which may then be subtracted from the signals as received to cancel or eliminate the effects of the non-direct path, unwanted multipath signals. The foregoing teachings correspond to the claimed "*generating a replica code...*".

The correlation products are used in a code-tracking loop to track and determine code phase. The most common scheme is to track points of equal magnitude (or power) separated by one C/A code chip width and estimate the time of arrival of the direct path signal as the mid-point between these points of equal magnitude. The points

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of equal magnitude on either side of the direct path arrival time are known as the early and late correlation time and the estimated arrival time of the direct path is called the punctual correlation time

In column 9, lines 15-30, Kohli et al. further teaches that multipath performance is improved by use of tracking means responsive to the matrix means for tracking a prompt delay from a source of the code together with means for monitoring correlation products representing lesser time delays than the prompt delay to detect the inaccurate tracking of a multipath signal from the source of the code. In addition, multipath errors are reduced by analyzing the ratios of correlation products surrounding the prompt correlation to correct for interference using means for causing correlation products of two of the time delayed replicas to be equal together with means for selecting the prompt delay in response to the ratio of the amplitude of the equal correlation products to a correlation product having a time delay therebetween. The prompt time delay is selected to be less than half way between the time delays of the equal correlation products if the ratio of the amplitudes of the equal correlation products to a correlation product having a time delay half way between the time delays of the equal correlation products is greater than one or more than half way between the time delays of the equal correlation products if the ratio of the amplitudes of the equal correlation products to a correlation product having a time delay half way between the time delays of the equal correlation products is less than one.

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Regarding claim 28, claim 28 is rejected on the same ground as for claim 25 because of similar scope.

Regarding claim 31, claim 31 is rejected on the same ground as for claim 25 because of similar scope.

Regarding claim 34, referring to figure 19, the code tracking error 310 includes a numerically controlled oscillator (NCO) for adjusting the timing of the PN generator.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 26-27, 29-30 and 32-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kohli et al. U.S. Patent 6,393,046.

Regarding claim 26, Kohli et al. does not teach the claimed limitation "wherein the first delay time is a delay of approximately -0.5 chip from the second delay time".

However, in column 17, lines 15-50, Kohli further discusses conventional GPS receivers maintain a lock on a satellite signal after acquisition by performing additional correlations, often called early and late correlations or correlations performed by early

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and late correlators. These correlations are displaced in time by a certain delay such as one half the width of a C/A code chip from the on-time or prompt correlator. That is, if the time of occurrence of a particular chip in the satellite signals is time t_0 , the prompt correlator under ideal conditions would multiply satellite signals 72 with a replica of the code with the same chip at time t_0 . The early correlation would be performed at time $t_0 - 1/2$ chip and the late correlation would be performed at a time equal to $t_0 + 1/2$ chip.

Whenever the synchronization between code generator 76 and satellite signals 72 as received begins to drift, the correlation results begin to change in favor of either the early or late correlation at the expense of the prompt correlation. Because selecting early correlation and late correlation as close as possible would improve accuracy of estimating the prompt correlation, it would have been obvious for one of ordinary skill in the art at the time of the invention, the conventional GPS receivers can be modified so that early correlation is a delay of -0.5 chip from the late correlation. Motivation is to improve accuracy of estimating the prompt correlation.

Regarding claim 27, as recited in claim 26, the early correlation would be performed at time $t_0 - 1/2$ chip and the late correlation would be performed at a time equal to $t_0 + 1/2$ chip. In view of that, the late correlation is approximately one chip from the correct timing.

Regarding claim 29, claim 29 is rejected on the same ground as for claim 26 because of similar scope.

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Regarding claim 30, claim 30 is rejected on the same ground as for claim 27 because of similar scope.

Regarding claim 32, claim 32 is rejected on the same ground as for claim 26 because of similar scope.

Regarding claim 33, claim 33 is rejected on the same ground as for claim 27 because of similar scope.

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Abbott et al. U.S. Patent 6,516,021 B1 discloses "Global Positioning Systems And Inertial Measuring Unit Ultra-tight Coupling Method".

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh Tran whose telephone number is 571-272-3007. The examiner can normally be reached on Monday - Friday from 08:00 AM - 05:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone

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number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KCT

Khanh Cong Tran

08/19/2005

Examiner KHANH TRAN